

Q U A N T A

THE NEWSLETTER OF THE INDEPENDENT QL USERS' GROUP

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INFORMATION ON THE GROUP

Membership of the Group is by subscription to the Newsletter, which is published monthly. Membership details are obtainable from the group Secretary. Membership of the Group is open to anyone with an interest in the Sinclair QL microcomputer.

Members requiring assistance with problems related to the QL may call the Secretary. An attempt will be made to put them in touch with a member who can help with the problem.

Workshops will be arranged from time to time in various parts of the country.

A membership list is obtainable from the Secretary.

Please send all contributions for the Newsletter to the Editor.

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EDITORIAL

This is the sixth issue of Quanta, so we have reached the end of our six months trial subscription period. We now have around 500 members, so it looks as though the success of the group is assured, provided that most of you renew your subscription, which will be £6 for the next six months, or £12 for the next year. You should have received a form for renewal of your subscription by now.

Together with your subscription renewal form you should have received notification of the Milton Keynes workshop which will take place on Sunday 29 July. Brian forgot to mention the venue, which is:

York House Community Centre,
London Road,
Stony Stratford,
Milton Keynes.

You do not have to book in advance for the workshop. Just turn up on the day if you wish. We have what we hope shall be a very interesting programme, the highlight of which will be a presentation by Tony Tebby, the designer of QDOS. A representative of Quest Ltd. will also be coming, to talk about their implementation of CP/M 68K for the QL, and their proposed floppy and hard disk drive add-ons. I have asked them to bring along some working hardware and software, although I cannot promise that it will turn up, as they only have CP/M working on their development system at present.

Also on Sunday will be the Inaugural General Meeting, so if you have any points to raise, either voice them at the meeting, if you are attending the workshop, or communicate them to Brian, preferably in writing. Both Brian and I will be standing for election, in our present capacities.

Leon Heller

MEMBERS' LETTERS

I joined on Saturday at Earls Court and met Rob Sherratt there. Noted that there are versions of QDOS and Psion software. For the record the versions I have are:-

QDOS	FE!	first edition?
Abacus	1.02	ABB
Archive	1.01	ABB
Easel	1.01	ABB
Quill	1.01	ABB

The initial copy of Abacus wouldn't run or backup. It gave a 'bad media' message. A replacement copy has been obtained through the returns procedure. I discovered a bug in Quill. The word rubout functions when in alternative typeface modes, would cause a crash. Psion advised that an update on this will be forthcoming.

Also, there has been some mysterious crashes from S-BASIC. For example, inside a REPeat loop the line:-

```
<line no.> IF INKEY$(£<channel>)=EOF THEN EXIT <loop name>
```

will cause a keyboard lock up.

Looking at the prospect of modifying a Philip's portable TV to get a monitor screen. Proposed circuit diagram enclosed. RGB through high frequency opto-isolators. Sync signal via normal aerial. I would welcome any comments on this. My way I hope to be able to use both F1 and F2 modes.

Eric Sargeant,
33 Breedon Street,
Long Eaton,
Nottingham,
NG10 4ES.

You may be interested to know that my QL was dispatched by the given deadline (end June). The BASIC and QDOS are located internally, leaving the ROM socket free. It is version AH, thanks for the tip about displaying this.

So far I have had no problems, except those caused by my own stupidity. The Microdrives are satisfactory and give about 220 sectors. I wrote a short program to display addresses and blocks of memory contents in hex. This worked after debugging, and SAVE and LOAD worked. My next step is to improve this program by allowing addresses to be input in hex as well as decimal, providing error checking, and displaying printable characters below the corresponding hex.

I have not had time to test all the facilities, so cannot yet confirm that there are no bugs. The BASIC seems rather slow. Handshaking is dealt with in the note on RS-232C. I like the type coercion. The manual is good, but lacks an index or table of contents.

Each day I am discovering fresh useful facilities and I must say I am greatly impressed. My only regret is that there appears to be no battery backup for the clocks but the machine is still incredible value for money.

I have been looking at memory to see how the organisation stated in Concepts (QDOS) works out in practice. I have located the command table at \$6821, and I notice that the ROM cartridge addresses return 0d. I looked above RAMTOP and was surprised not to see FF (or perhaps 00). Instead: I found that the remaining three quarters of address space each returned an image of the first quarter. I hope this does not indicate an addressing fault which could interfere with expansion.

I note that the system ROM/EPROM is free above \$AD50. It is a pity that this space could not have been used for double-length arithmetic, but perhaps you will be writing routines for RAM.

The book says that one should switch on mains before plugging in the power. and conversely to switch off. I suppose this is to prevent damage from switching transients, but it is rather a nuisance.

L.C.H.

/* Your wish is our command! An index of BASIC keywords is included in this issue. */

I received my QL just over 2 weeks ago, but despite the superb QUILL package, I am writing to you using Tasword 2 on the Spectrum.

It is my view that IQLUG (and everyone else) should cease Sinclair-bashing for premature announcement and non delivery (he has pleaded guilty, and appears to be doing everything possible to make amends), and start hammering for the other items which need attention to start getting it!

Firstly, I wrote to Sinclair requesting that delivery of my QL be delayed (yes, delayed!) until he could supply one with an internal ROM and a manual bearing some relation to the hardware supplied. He wrote back - a miserable letter which effectively said "Get lost. We still intend to supply any old machine. Unless that is, you cancel it". I phoned up and said "Cancel it!" only to be told that cancellations were only acceptable by letter. So I wrote, and said 'Cancel it!' Three weeks went by, and it arrived, complete with EPROM and irrelevant manual, followed next day by a letter saying 'Sorry. We have already dispatched it. Send it back if you don't want it'. This last letter was a standard one, undated, obviously being sent out by the hundred. Believe me, after this treatment, if I could have sent it back and bought a Taiwanese substitute, I would have done so. However being a little weak willed, I decided to keep it, rather than return it and wait another 6 months.

The machine is a mixture of a little bit of joy and a lot of sorrow. The joy is the three superb packages (perhaps four but I haven't had time to check out ARCHIVE). The sorrow is the marketing strategy, which will surely kill the machine stone dead within a year if it is not corrected. The Psion packages are included in the cost. But who else, I ask you, is going to write QL software whilst:

- i) The only way of distributing it is on a £5 Microdrive cartridge, and
- ii) There is no guidance in the manual on the subject of protection or even details of the system variables to enable one to work it out.

The Spectrum was a winner because:

- i) It is a pleasure to work on (a decent editor, which we all take for granted, and relatively few ROM bugs).
- and ii) There is a mass of software available, of all types.

The QL has neither advantage, and I fear for its future. IQLUG will, of course die with it if it goes.

Three things (perhaps four if you include the Centronics interface) are essential to enable software production for the QL to take off.

- i) Full information about QDOS, system variables, protection, storage utilisation, UDGs and all the things we take for granted on the Spectrum. I mean public information - not just leakage to a few chosen software houses.

- ii) A SINCLAIR cassette interface. I am aware of the view that a cassette is a nonsense on a machine of this size and power. However, not having one throws the games distribution market overboard to be raped by the BBC Model C, and I don't accept that the low-end business market is large enough on its own to generate enough sales. Nor is it adequate to say that someone else 'Joe the Lion' will produce one if Sinclair does not. Someone

else may, but it will not have the soma encouraging effect on the software industry as a Sinclair product. Sadly, a major ROM change is necessary to do it properly. Time is running out.

iii) A SINCLAIR diskette interface. Why? To climb slightly above the very low-end business market. To make software available without having to muck about changing cartridges. In short to make the machine a pleasure to use. Why Sinclair? You can probably work it out by now!

The above list of three or four items is not exhaustive. There is also the appalling design of the RS232 ports to be corrected, and the dearth of information or the use of machine code.

Peter -Morley,
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High Legh,
Near Knutsford,
CHESHIRE
WA16 6LX

P.S. I enclose a copy of my last letter to Sinclair. Any light which IQLUG is able to shed on these matters would be welcome. But please, I am really fed up with reading about delivery problems. If a lot of people cancel (by Letter!) and say what they want, the result may amaze everyone.

QL TECHNICAL INFORMATION

The QL USER GUIDE, CONCEPTS section, P39 L9, says "A more complete description of QDOS is available from Sinclair Research,".

Would you please send it.

Would you also please comment, or send information on the following points:-

- (1) I need a full list of system variables and their addresses.
- (2) How are variables and numeric literals stored?
- (3) How do UDGs work? I particularly need to display on the screen, both an upwards pointing arrow and downwards pointing arrow, neither of which appears to be in the character set.
- (4) How do I determine the amount of user RAM still available for more code?
- (5) How can I prevent a SuperBASIC program from being broken into and listed, (preferably by means of a routine which transfers control to a specific line number)?
- (6) Where do you recommend machine code is located? If above RAMTOP, then how do I find RAMTOP, and how do I reset it?
- (7) Can you recommend a good book on 68008 machine code?
- (8) Is an assembler available, or planned?

Yours sincerely

May I propose to IQLUG members that we vote you, our dutiful editor, a decent printer to be purchased from Club funds. Hands up all in favour! And what about a modem and subscription to Micronet?

Sorry to note that the short item on the Centronics interface left out all the relevant facts, so I phoned J B Hollingsworth at Penrh.... and established :-

1. It uses either of the serial ports and so can be addressed as the Manual.
2. Miracle Systems Ltd are at Kings Hedges Cambridge CB4 2UE Tel. 312886.
3. It costs £49 (including VAT I think).

May I make an appeal that the BUGS list be published. It can be pretty frustrating programming an unfamiliar machine but doubly so when one can't be sure whether it is an error in the manual, a bug that's common to all machines or one which is peculiar to one's own machine or version or just an error of programming. My personal bugs noted include:-

1. INT produces an error when the argument exceeds about 2.4e8. Sounds large but when used to format numbers to several places of decimal by $INT(\text{number} * 1000) / 1000$ say, it easily arises.
2. INSTR returns 1 for a null in a real string!
3. The clock has rather odd limits. Can't accept a date earlier than 1961 but no mention of same in Manual.
4. The recommendation of using upper case for the name of procedures is not accepted. The name is echoed in lower case regardless of how it is entered.

My machine is the PM version and it hangs up with alarming regularity. Particularly when it gets warm.

I have very mixed feeling on the merits of Structured Basic. I accept the code is much easier to follow and hence maintain but programs get extraordinarily lengthy and I am not clear how much RAM is available for the code as distinct from the variables. One can enter a subroutine at any line, but a procedure can only be entered at the beginning so one may need more procedures than subroutines and on average it requires about six lines to accomplish what one line of a subroutine would normally cover (using say 80 character lines).

I find SuperBASIC rather less than super in many respects:-

It's taken me a month to believe that they are serious that one has to type LOAD space MDV1 underline PROGRAMNAME just to load a program.

Why has SGN been omitted. One can write a Procedure for it but should one expect to? The odd thing is that it is provided in the Abacus prog.

Surely it must support pattern matching and wild cards for filenames. I see no mention of it.

I find the loss of the VAL function annoying as it provided an easy Basic method of validating numerical input e.g. IF VAL(number\$)=0 and number\$<>"0" etc. but it appears unduly complex to avoid the dreaded ERROR IN EXPRESSION which results from the attempted coercion of number=number\$ if alpha characters have been input.

My experience has been on Commodore machines. I find it odd that Sinclair make a great play of features that the humble PET has displayed for years. Like device independent IO, windows (much easier to define on the PET). And when will Sinclair manage to equal the full screen editor of the PET instead of this pathetic line edit facility?

Leon Heller says the poor speed is due to the numerical precision. Perhaps I misunderstand but the precision is less than the PET and using the INT function to format numbers as described above, one often loses several significant figures from the output. I expected the equivalent of a 'double precision' system on an 8 bit machine to come from this advanced processor.

How does one interrogate the error channel from basic? How does basic read file names from the directory in order to make an assignment? Can it emulate the PET's ability to create program lines by printing the line to the screen and POKeIng the ENTER code into the keyboard buffer?

Surely there must be a method to pause and/or slow a listing.

The Manual does not mention these things. Should we assume that, as it obviously did not get even the most casual of proof reading, these matters are just Manual omissions? Sinclair could at least have offered a prize to the person who could list most errors in the Manual!

With these and many other questions in mind I telephoned Camberley in mid-June and asked to obtain a copy of the ODDS Manual mentioned in the User Manual. Not available and no date for it was the answer. On reading Leon Heller's mention of having ordered a copy at the quoted rate of £10 I rang again to be told that it was not available and our Editor's report was simply not true! I rang Leon to learn that he now had the documentation and had preferred to pay £35 for same to Tony Tebby, who wrote most of it and had Sinclair's permission to disseminate it. I then telephoned Tebby who explained that Sinclair were finally editing the QDOS Manual to sell at £10 but I could obtain it from him for £35 including the service of answering questions which may arise. So how do they manage to get their communications so balled up!

But all this raises another question. Why is it that most computer manufacturers seem to go to great lengths to frustrate their customers by secreting the information needed to realise the potential which their designers built into the machine? And that is a serious question. I really would like to know why they consider their interests are best served by selling black boxes?

On a simpler level, has anyone discovered what the undocumented keyword WIDTH does or was intended to do?

I none-the-less have great expectations from my QL but my greatest misgiving is in becoming a captive market for Microdrive cartridges at the rip-off price of £5 a time. I've already had one snag itself up in the works making it US. I've asked Sinclair to replace it, but that was 14 days ago and no reply as yet.

And has anyone heard from QLUB? Or are they just too embarrassed to publish? Incidentally, can anyone explain why the latest entry on Sinclair's Product News on Prestel refers to the introduction of Microdrives in July 1983!

John Tanner 43 Northumbria Drive Bristol BS9 4HL
Tel (0272) 623401 Mailbox 272623401

P.S. Bought one of the special plugs to prevent dirty current. Didn't make a damn bit of difference, still hangs up.

I tried three green screen monitors and each suffered from the 'crawling effect', a sort of ripple on the red and green but ok on white. The nine inch Apple IIc monitor gave very good definition but at £140 plus VAT list seemed a bit steep.

New info. on the QDOS manual. Sinclair offer certain documentation now at £13 and expect to publish the manual proper at £23 in the autumn.

/* Just for the record, I actually got the QDOS manual out of Sinclair at Cambridge, for £10. */

I've had my QL for several days, and I suppose my first reaction was welcome to my much criticised friend. I did not expect too much. But, as you have said in the May issue, there are oddities. I get a time of 59 seconds for 30,000 loops in Gary's 'date' program, but oddly I cannot get any loop program to run if I try to enter 'END FOR'. I have to write 'END FOR t' or 'END FOR n' where 't' or 'n' is the variable.

What I've seen of Quill, I quite like and think it has some advantages over SCRIPSIT. A major snag is that there does not appear to be any way of finding out how much memory is left whilst typing in a long report. I have yet to find too how to find residual memory in SuperBASIC. I note that in ABACUS a figure of 14K for memory is given on running in, and presumably this will show how much memory is being used as a program is entered. But it is a bit depressing to have a 16 bit computer which starts with less residual memory than VISICALC in a Tandy Model I, and I suspect that QUILL has less residual memory too. Will the 0.5 MB arrive in 1984 or 1985?!

I am agreeably surprised that a black and white television used as monitor is quite readable with an 80 character line. Incidentally, I was told by a television service engineer that he has seen reference in a trade journal to a colour television set with RGB as a separate channel. This makes sense, but unfortunately he did not know the supplier.

Any news as yet regarding suppliers (at lowest prices) of interfaces to parallel printers (Daisy Wheels), and interfaces to disk drives? Also chapter and verse for the best way of interfacing the TRS80 Model I (fitted with RS232) to the QL so that they can talk to each other?

W.T.Cowhig, 21, Priory Road, SALE, Cheshire. M33 2BS. 061-973-3604

Thank you for the copies of QUANTA. Please can I make a few points?

1. I know nothing of machine code and assembler, please bear me, and others like me, in mind when compiling (don't know anything about that either!) the newsletter.
2. I would like to know why people like me who ordered a QL by cheque are being penalised. Sure all customers, including those who ordered by credit card, are being compensated with the RS232 lead but Sinclair Research have had my money (OK in a Trust Account, but who gets the interest?) since I ordered in early February. If I had ordered by credit card then none of my money would have left my control until the order was dispatched I feel 'conned' mainly because like others I was also told "Yes we have learnt from the mistakes of the SPECTRUM there won't be any delay in processing your order."

(A quote from the telephone conversation with the Sales Girl when I placed my order.) If Sir Clive reads this letter perhaps he should look into the ways that the orders were obtained, I would if I were him.

3. News of software to come. Can I suggest a Mail Merge program for Quill and Archive so that the QL can be used for Mailshots, also something on Modems please.

Keep up the unpaid work! Any chance of a membership list so I can contact any QLers in this area?

Malcolm Collins,
7 Heath Drive,
Chelmsford,
Essex CN2 9HA

Just got mine, so no doubt there're thousands around by now.

You any care to fill the first hole I found by publishing the enclosed SuperBASIC index. If you do, I'd be glad if you could include a note on the lines of "Reproduced from Computers in Schools by permission of the Editor"!

Other holes I hope to see filled in your pages:

- a. How can one read time to milliseconds or seconds rather than seconds?
- b. (How) can one user-define characters?
- c. (How) can one get into m/c code or assembler?
- d. what nice PEEK/POKE addresses are there?

No doubt there are lots more, but I've had the QL only two days! Now I'll look forward to your magazine with even more excitement - all the best with it!

From the Editor of "Computers in Schools"

Eric Deeson
Highgate School,
Birmingham B12 9DS

As one of those still awaiting delivery of a QL, I am very interested to find out as much as possible about the machine. I have already written to Sinclair to try and get sufficient details to design my own disk interface. However, they are being decidedly coy about an interface specification. Their reply could only mutter darkly about infringement of the guarantee. How on earth they expect to market a business machine without decent long term storage of sufficient capacity and reliability beats me? As some other people have been more successful in this direction it would appear that I need the right connections. Thus I would be very grateful if you would send me details of IQLUG.

P. Malcolm Pigott
75, Wickham Way
BECKENHAM
Kent
BR3-3AH
H 01-650-0884
B 01-634-7654

I ordered my QL on 16 January, but did not receive it until the 30 May, so much for Sinclair's promises. I even had a card dated 1 February saying it 'was being processed for despatch'.

Of courses mine has a 'thing' in the ROM port so I guess I will have to send it back at some stage, but at least I can use it now. I am not an expert but I have a son who is quite proficient. I intend to use the QL in my business for accounts, word processing and eventually doing profit forecasts when I can master programming. At present I have to rely on my Sinclair User magazine.

Rob Macmillan,
Willow Cottage,
Warnford,
Southampton SO3 1LE.

We are a specialist software house dealing exclusively in Insurance Broker applications and have a reputation as market leaders in this field. We have now developed a motor insurance quotation system for the QL which will be available from the end of July which we believe will be the first independent software for the QL on the market. I enclose some literature for your perusal and would advise you that the cost of MICROQUOTE will be £795 (which includes QL, monochrome monitor and software) plus £43 per month for updates. All prices include VAT. For software only we would ask £295 (+ £43 p.m.).

If any of your members work in the Insurance profession and would like further details or a demonstration of MICROQUOTE they should contact me.

David Espin,
Dataller Computer Services Ltd.,
Rodney House,
King Street,
Wigan WN1 1BT.
Tel: (0942) 496429

CASSETTE INTERFACE (6800 SYSTEM)

The ROM monitor in my 6800 system (see Quanta Issue 5, pp 21-22) provided a very slow speed of 10 char/s, using unnecessarily short blocks, and sending data in one nibble per byte at 300 baud.

I obtained an increase of speed to 30 char/s by writing binary save and load programs, using the following format:-

X4 label (single alpha) | Prog. name Date (opt.) | \$04
X1 data count (FF=256 bytes) Address (2 bytes) Data
(normally 256 bytes) Checksum.

The last block gives the program counter Address and value. Then X9.

Later I added a 1200 baud interface on Port #3, using a Cottis-Blandford circuit (kit from Newbear). The first attempt was a failure (except at 300 baud) and I tried again by providing sockets for the chips. One chip proved to be very critical and I had to try several before getting reliable operation at 1200 baud. I still found a few errors at 2400 baud and decided to be content with what I had achieved. Errors now occur almost never, but LOAD provides a verification option, so I always use this immediately after a SAVE (called PUNCH in my nomenclature - that dates me and my system). Both programs provide motor control, and LOAD will search for the alpha label and report name (and date) on completion. The hardware uses tone-burst encoding with 2400 Hz for Mark (1) and 1200 for Space (0), and I would recommend adhering to this standard.

There are complications in adapting this to the QL - power supplies, clocks (E is available on the expansion bus at 14b), motor control, etc. Having the 6800 and assuming it continues to function, I would use the QL RS-232C. to communicate with the 6800, putting data in a circular buffer, and letting the 6800 handle formatting, stripping and motor control.

One point I forgot to mention is that the Newbear board provided the transmitter clock from a 555 chip. I did not like this, so used 76.8 KHz from the baud rate generator on the MPU board. The clock is divided before applying it to the ACIA.

L.C.H.

USING QDOS

Having acquired a copy of the QDOS documentation, and not yet having a QL of my own, I took my CP/M system and MC68000 cross assembler down to Jeremy San's residence in Mill Hill, where Jeremy, Fouad Katan and I connected his QL up to my system, via the serial Ports. Then followed an extremely frustrating afternoon, whilst we tried without success to set a simple QDOS function to work, by writing a small program in assembly language, cross-assembling on the CP/M system, and downloading the Motorola S-format object code file into the QL, where a SuperBASIC program written by Fouad and Jeremy poked it into memory. A CALL to the start of the program should have resulted in the program performing the desired function. We eventually admitted defeat and telephoned Tony Tebby, the author of QDOS, for assistance. We found that we had not specified the channel number correctly, and on changing it to the correct value, the program then ran correctly and printed an asterisk on the screen!

Here is the program:

ORG	\$33450	210000 DECIMAL
MOVE.L	#5,D0	QDOS FUNCTION TO SEND A BYTE
MOVE.B	#'x',D1	BYTE TO SEND IN D1
MOVE.W	#-1,D3	TIMEOUT IN D3 (INDEFINITE)
MOVE.L	#\$10001,A0	CHANNEL ID IN A0
TRAP	#3	DO IT
MOVE.L	D0,ERROR	SAVE ERROR CODE
CLR.L	D0	CLEAR D0 READY FOR RETURN TO BASIC
RTS		
ERROR: DC. L.	0	ERROR CODE SAVED HERE
END		

CALL 210000 from BASIC resulted in the display of an asterisk at the current cursor position.

The reason why we had problems initially was that we did not know that the upper word placed in A0 had to contain a tag, with the same value as the channel number in the lower word. The program ran, and returned control to BASIC, but the QDOS function returned a 'channel not open' error (-6).

This might not seem much of an achievement, but it does show that assembly language programming on the QL is quite feasible, and not too difficult, provided you don't make any silly mistakes.

My thanks to Jeremy and Fouad for their assistance.

Leon Heller

HALTING A LISTING

Several members have asked how one can stop the listing of a program, as this desirable feature does not appear in any of the QL documentation. All you have to do is press the control key and F5 simultaneously. Pressing any other key will then cause the display to resume scrolling.

My thanks to Jeremy San and Malcolm Newport.

Leon Heller

QDOS DOCUMENTATION AVAILABLE

Full details of QDOS, plus lots more information on the QL hardware and software are available from Tony Tebby, the designer of QDOS. Tony, who has now left Sinclair, has their permission to supply the documentation to users. The price is £35, inclusive. The address is:

QJUMP,
24 King Street,
Rampton,
Cambridge CB4 4QD.
Tel: (0954) 50800

Tony is prepared to provide some limited assistance to purchasers of the documentation over the 'phone. He can also provide a consultancy service to software houses who are writing code for the QL.

I managed to get a copy of this documentation, out of Sinclair, but I believe that they are now referring people to QJUMP/Tony Tebby. The standard of the documentation, is pretty good, by the way.

This documentation will only be of use to those of you who are reasonably proficient in MC68000 assembly language. Don't blame me if you buy it and can't understand any of it. We will be including articles in Quanta on how you can access some of the QDOS functions from BASIC, however.

Leon Heller

AN ALTERNATIVE TO QDOS

GST Computer Systems Ltd., of Cambridge, have announced that their MC68000 operating system, 68K/OS, will shortly be made available for the QL. This operating system was commissioned by Sinclair, for incorporation in OEM versions of the QL, to be marketed by GST.

GST have promised me an evaluation copy of 68K/OS to run on the QL and I will be reviewing it in Quanta. An acquaintance of mine has seen it in operation, and he was very impressed.

GST tell me that they are not quite sure yet how it is to be marketed, or how much it will cost. I would suggest that a likely price will be £50 for the operating system, with each language and utility costing about the same.

It is interesting to speculate on how 68K/OS will fare in comparison with QDOS. My feeling is that advanced hobbyists, students and software developers will opt for 68K/OS, using it to develop software that could be subsequently run under QDOS, for possible sale to end-users.

Leon Heller

QLUB MEMBERSHIP

Several members have complained to me that although they have paid for membership of QLUB (pronounced 'club', incidentally) and have received their machines, they have not received their QLUB membership number, or details of how to write to Psion for advice and assistance regarding the Psion programs. I have been in touch with Sinclair about this matter, and they told me that anyone eligible for QLUB membership who has not yet received their membership number should contact Camberley.

Incidentally, QLUB have yet to issue a single newsletter! I find it rather amusing that here I am, working on the sixth issue of Quanta, with just two of us running IQLUG on a shoestring, whereas a company the size of Sinclair, with all their resources, are unable or unwilling to provide much in the way of user support. They also have the gall to charge £35 for all this inactivity!

Leon Heller

SINCLAIR MEMORY EXPANSION

Mr Nigel Searle has recently been quoted as stating that Sinclair are working on a 128K RAM expansion unit. Perhaps they got the idea from an earlier issue of Quanta where I suggested that independent suppliers might be producing such a unit, because of the likely delay in making the full .5 Mbyte expansion. This would alleviate the problem that a lot of users of the Psion packages are encountering with the limited amount of memory available, especially when using Abacus. I recently spoke to someone at Psion, and he told me that they had one of the .5 Mbyte expansion units connected to a QL, and that it transformed the operation of their software.

Leon Heller

```
1000 REMark List Program
1010 REMark
1020 REMark Lists one file or a number of files from
1030 REMark Microdrive 1. If any "skip" statement is
1040 REMark found positioned one space after a "REMark"
1050 REMark then this program will send a form feed to
1060 REMark the printer, and start a new page heading.
1070 REMark
1080 REMark The program as supplied is set up to output
1090 REMark to an Epson RX80 dot matrix printer.
1100 REMark For any other printer, modify the values
1110 REMark loaded into the variables:
1120 REMark
1130     Enlarged$ = CHR$(27) & "W" & CHR$(1)
1140     Bold$     = CHR$(27) & "E"
1150     Unenlarg$ = CHR$(27) & "W" & CHR$(0)
1160     Unbold$  = CHR$(27) & "F"
1170     Form$    = CHR$(12)
1180     Unskip$  = CHR$(27) & "0"
1190     LH_marg$ = CHR$(27) & "1" & CHR$(10)
1200 REMark
1210 REMark
1220 REMark Author   : Rob Sherratt
1230 REMark Date     : 18th June, 1984
1240 REMark Home Tel : 0394 272782
1250 REMark
1260 REMark
1270 DIM line$ (255), fname$ (50,50), fnum$ (50),a$(4)
1280 pagelength = 60
1290 Display_initial_text
1300 get_directory_on_file
1310 list_and_read_directory
1320 issue_list_commands
1330 REMark
1340 REMark skip  _____ end of program _____
1350 REMark
1360 REMark
1370 REMark
1380 DEFine PROCedure Display_initial_text
1390     WINDOW 220,182,268,10
1400     INK 0
1410     PAPER 0: CLS: BORDER 2,0: PAPER 4
1420     PRINT "Auto file printer": PAPER 0
1430     INK 7
1440     PRINT "Prints a specified subset of"
1450     PRINT "files from Microdrive 1 to"
1460     PRINT "an Epson printer, and provides"
1470     PRINT "a heading for each page.",\
1480     PRINT "Press any key after loading mdv1_""\
1490     REMark
1500     REPeat loop: IF INKEY$ (-1) <> " " THEN EXIT loop
1510 END DEFine Display_initial_text
1520 REMark
1530 REMark
1540 REMark
1550 DEFine PROCedure get_directory_on_file
1560     DELETE mdv1_d i r _lst
1570     OPEN_NEW #4,mdv1_dir _lst
1580     DIR #4,mdv1_
1590     CLOSE #4
1600 END DEFine get_directory_on_file
1610 REMark
1620 REMark skip
```

```
1630 REMark
1640 DEFine PROCedure list_and_read_directory
1650 PAPER 4: INK 0
1660 PRINT "Directory list. Type ";
1670 PAPER 0: INK 7
1680 PRINT " y ";
1690 PAPER 4: INK 0
1700 PRINT " after "
1710 PRINT "each file if you want it printed."
1720 PAPER 0: INK 7
1730 OPEN_IN #4,mdv1_dir_lst
1740 n=0
1750 REPeat getfile
1760     INPUT #4, fname$ (n)
1770     IF n >1 THEN
1780         PAPER 0: PRINT n-2;" "; fname$ (n) ;
1790         FOR k=LEN(fname$(n)) TO 16: PRINT " " ;
1800         a$ = n-2
1810         FOR k = LEN(a$) TO 4: PRINT " " ;
1820         PRINT ":";
1830         fnum$(n) =INKEY$(-1)
1840         PRINT fnum$(n)
1850     ELSE
1860         PAPER 2: PRINT fname$(n)
1870     END IF
1880     IF EOF(#4) THEN EXIT getfile
1890     n=n+1
1900     END REPeat getfile
1910     CLOSE #4
1920     PRINT
1930 END DEFine list_and_read_directory
1940 REMark
1950 REMark skip
1960 REMark
1970 DEFine PROCedure issue_list_commands
1980 INK 4
1990 OPEN #2,scr_236x184a32x10
2000     PAPER #2,0
2010 CLS #2
2020 INK #2,7
2030     OPEN #5, ser1
2040 PRINT #5,Unskip$ & LH_marg$;
2050     FOR r = 2 TO n
2060         IF fnum$(r) ="y" THEN
2070             PRINT "listing file ";fname$(r);" ..."
2080             OPEN_IN #4,"mdv1_"&fname$(r)
2090             page = 1
2100             lines = 1
2110             new_title
2120             REPeat list_file
2130                 INPUT #4,line$
2140                 PRINT #5,line$
2150                 PRINT #2,line$
2160                 lines = lines + 1
2170                 IF EOF(#4) THEN EXIT list_file
2180                 IF lines > pagelength THEN new_title
2190                 IF line$(13 TO 16) = "skip" THEN new_title
2200             END REPeat list_file
2210             CLOSE #4
2220             CLS #2
2230         END IF
2240     END FOR r
```



```
2250 CLOSE #2
2260 CLOSE #5
2270 OPEN #2,scr_454x184a32x10: INK #2,7
2280 END DEFine issue_list_commands
2290 REMark
2300 REMark skip
2310 REMark
2320 DEFine PROCedure new_title
2330 CSIZE #2,1,1
2340 CLS #2
2350 PRINT #5,Form$ & Enlarged$ & Bold$;
2360 PRINT #5,fname$(0);" ";fname$(r);" page ";page\\
2370 PRINT *5,Unenlarg$ & Unbold$;
2380 PRINT #2,fname$(0); " ";fname$(r);" page ";page\\
2390 page = page + 1
2400 lines = 5
2410 CSIZE #2,0,0
2420 END DEFine new_title
```

```
1000 REMark BOOT PROGRAM
1010 REMark
1020 REMark This program runs automatically
1030 REMark from drv1_ after a system reset
1040 REMark
1050 MODE 512
1060 WINDOW #0,512,256,0,0
1070 CLS #0
1080 WINDOW #2,454,184,32,10
1090 WINDOW #1,218,184,268,10
1100 WINDOW #0,454,50,32,200
1110 PAPER #2,0: INK #2,7
1120 PAPER #1,2: INK #1,7
1130 PAPER #0,0: INK #0,7
1140 BORDER #0,1,2
1150 CSIZE #2,0,0
1160 CSIZE #1,0,0
1170 CSIZE #0,0,0
1180 OPEN #4,ser1
1190 PRINT #4,CHR$(27); "@";CHR$(27);"0";
1200 CLOSE #4
1210 a$=DATE$
1220 IF a$(1 TO 4) = "1961" THEN get_date
1230 CLEAR
1240 pr_dates
1250 DEFine PROCedure get_date
1260 PRINT #0, "Please input the date and time in the form ..."
1270 PRINT #0,"... of numbers followed by ENTER ..."
1280 PRINT #0,"year","month","day","hours","minutes","seconds"
1290 INPUT #0,year,month,day,hours,minutes,seconds
1300 SDATE year,month,day,hours,minutes,seconds
1310 END DEFine get_date
1320 DEFine PROCedure pr_dates
1330 CSIZE 1,1
1340 REPEAT print_date
1350 AT 3,1:PRINT DATE$
1360 IF INKEY$(0)<>" " THEN EXIT print_date
1370 END REPEAT print_date
1380 CSIZE 0,0
1390 END DEFine pr_dates
```

```
1000 REMark Duplicate Program
1010 REMark
1020 REMark Copies all files from the source cartridge
1030 REMark specified and stores them on the
1040 REMark destination cartridge specified.
1050 REMark Note that the destination cartridge
1060 REMark must be formatted first.
1070 REMark
1080 REMark Author   : Rob Sherratt
1090 REMark Date    : 25th June, 1984
1100 REMark. Home Tel : 0394 272782
1110 REMark
1120 REMark
1130 DIM fname$(50,50),a$(4),S$(10),D$(10)
1140 Display_initial_text
1150 get_directory_on_file
1160 list_and_read_directory
1170 issue_copy_commands
1180 REMark
1190 REMark. _____ end of program _____
1200 REMark
1210 REMark
1220 REMark
1210 DEFine PROCEDURE Display_initial_text
1240 WINDOW 220,182,268,10
1250 INK 0: PAPER 0: CLS #2: CLS: BORDER 2,0: PAPER 4
1260 PRINT "Microdrive cartridge duplicator"
1270 PAPER 0: INK 7
1280 PRINT "Copies all files from the source"
1290 PRINT "cartridge and stores them on the"
1300 PRINT "destination cartridge (which must"
1310 PRINT "be formatted first)"\
1320   REMark
1330   REPEAT get_drive_numbers
1340   INPUT "Source cartridge number ? ";S$
1350   S$ = S$(1)
1360   INPUT "Destination cartridge number. ? ";D$
1370   D$ = D$(1)
1380   PRINT
1390   test = (S$=D$)OR(S$<1)OR(S$>8)OR(D$<1)OR(D$>8)
1400   IF test THEN
1410     PRINT "Invalid. Drive numbers may be"
1420     PRINT "in the range 1 to 8 and must"
1430     PRINT "not be equal. Please reenter."\<
1440   ELSE
1450     EXIT get_drive_numbers
1460   END IF
1470 END REPEAT get_drive_numbers
1480   REMark
1490   PRINT "Press any key when you are ready."\<
1500   REMark
1510 REPEAT loop:IF INKEY$(-1)<>" " THEN EXIT loop
1520 END DEFine Display_initial_text
1530 REMark
1540 REMark skip
1550 REMark
1560 DEFine PROCEDURE get_directory_on_file
1570   DELETE "mdv"& S$ &"_dir.lst"
1580   OPEN_NEW #4,"mdv"& S$ &"_dir.lst"
1590   DIR #4, "mdv "& S$ &"_"
1600   CLOSE #4
1610 END DEFine get_directory_on_file
```

```
1620 REMark
1630 REMark
1640 REMark
1650 DEFine PROCedure list_and_read_directory
1660     PAPER 4: INK 0
1670PRINT "Directory list"
1680PAPER 0: INK 7
1690OPEN_IN #4, "mdv"& S$ & "_dir_lst"
1700     n=0
1710REPeat getfile
1720     INPUT #4, fname$(n)
1730     IF n>1 THEN
1740         PAPER 0: PRINT n-2, " ";
1750     ELSE
1760         PAPER 2
1770     END IF
1780     PRINT fname$(n)
1790     IF EOF (#4) THEN EXIT getfile
1800     n=n+1
1810     END REPEAT getfile
1820CLOSE #4
1830     PRINT
1840 END DEFine list_and_read_directory
1850 REMark
1860 REMark
1870 REMark
1880 DEFine PROCedure issue_copy_commands
1890     FOR r = 2 TO n
1900         INK 4
1910         PRINT "copying file "; fname$(r); " ..."
1920         DELETE "mdv"& D$ & "_ "& fname$(r)
1930         COPY "mdv"& S$ & _ & fname$(r) TO "mdv"& D$ & _ "& fname$(r)
1940         END FOR r
1950 END DEFine issue_copy_commands
1960 REMark
1970 REMark
```

Daisy Wheel Printer II (Tandy) and the QL

This is being printed out using the parallel interface supplied (very promptly) by Miracle Systems Ltd of Cambridge (0223) 312 886. (£49 inc VAT & postage). All works quite well, using the Quill Word Processor.

It might save members' time if I give the answers one needs to put into the program which sets-up this Daisy Wheel printer - 'INSTALL BAS'. It is possible that similar entries will do for other Daisy Wheel printers.

The first few lines are fairly standard - DWII, NONE, 9600, 66, 64 or what you will, NO or YES.

End of Line Code is 13 which prints as <CR>.

Emphasise ON is 8 ... <DEF>. Same for OFF.

Underline ON is 15 ... <SI>. OFF is 14 ... <SO>.

Subscript ON is 27,28 ... <ESC> <FS>.

Subscript OFF is 27,30 ... <ESC> <RS>.

Superscript ON is 27 30 ... <ESC> <RS>.

Superscript OFF is 27,28 ... <ESC> <FS>.

Translate1 can be "£", 163 to give the pound.

Note that in QUILL, setting the page and width parameters by DESIGN over-rides this. The big snag (and this is really major for me) is that apart from just two characters which one can select to be given by translate 1 and translate 2, it is not possible to make use of the many foreign characters and special symbols on the Daisy Wheel. This is back to the early days of SCRIPSIT, when I wrote a special machine code patch to add on to SCRIPSIT to make these characters usable. Will it be necessary again to do it for Quill?? And will there be enough room on the cartridge?

The commands are wordy! To LLIST the file ADJUST_BAS to the printer, one has to say COPY mdv1_adjust_bas TO ser1c (Concepts page 16) ; I have yet to find a way of sending to the printer the program one has just entered (but not made into a file). Oh, for the good old command LLIST! Or for JKL! Incidentally, ADJUST_BAS is a long program (320 or so lines) and is a good exercise for understanding SuperBASIC!

It is disappointing too that underlining a heading (see above) does not underline the spaces between words, and at the moment there seems no way of overcoming this - there is no "nothing" symbol as in SCRIPSIT.

Alas, operations like SAVING and PRINTING involve the frequent use of the microdrives and this is very delaying. I suppose one could get used to it, but ... Disk drives are the answer, but will this not mean quite a modification to the PSION programs themselves? At the moment they need frequent use of the microdrives as scratch pads for their housekeeping jobs and to get their memory. It seems anomalous that the QL seems not able to put its main program fully into RAM, although this shortage of memory will in due course be overcome if and when the 0.5 MB comes.

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Just a postscript to say that July's copy of Television has a paragraph on Monitors and Receiver-Monitors. The 14" Ferguson Model MC01 based upon the TX90 chassis is being released at the end of August at £229. There are separate sockets for composite video and RGB inputs. It says that linear or TTL (on/off) RGB inputs are acceptable. A pre-set video gain control is included to match with different computers. It can optionally run on a 12 or 24 volt battery. Ferguson also will make a 12" black and white monitor which claims to display clearly up to 100 characters per line - price £80 or less. Another firm is ITT who supplies receiver-monitors - the 14" RL2315 costs £299 with a dot resolution of 420. ITT also sell much larger sets - 22" and 26" models with 540 and 630 resolution.

INTERFACING AN HR5 SERIAL PRINTER

Having just taken delivery of whole dongleless QL, I rushed out to buy a cheap RS232 printer to keep me going until a parallel converter gets installed.

My lucky day; someone has an HR5 (serial) in stock at only £148. I rush have with a breakout box and a wet towel and start to struggle with the manuals-. Four hours later, still not confident of exactly understanding how to PRINT in SBASIC, the lightning flash strikes.

For the benefit of anyone else who intending to connect, here's the trick.....

The HR5 has two lines which have to be high before it can print - DR(pin 6) and CD(pin 8); the QL lead has only one (pin 6).

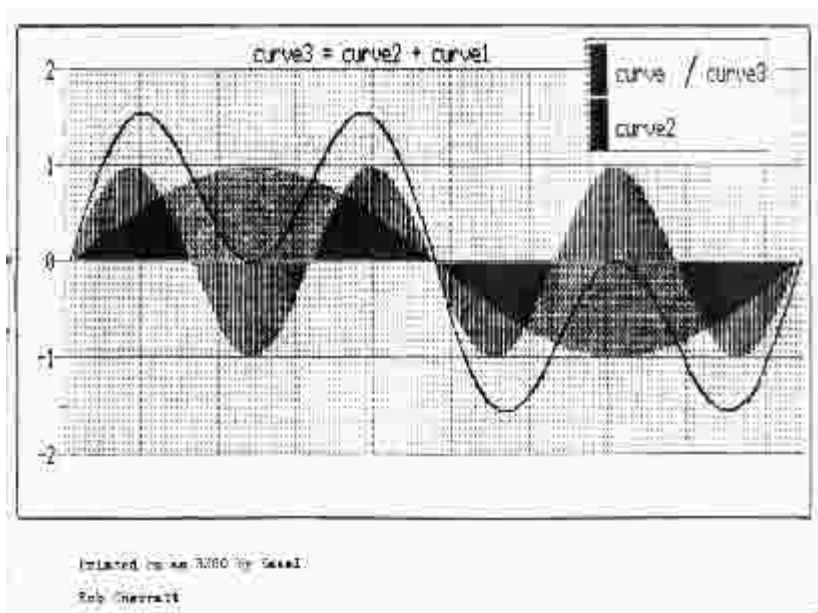
Connect pin 6 to pin 8 inside the D plug hood and now the system works perfectly , even at 9600 Baud.

Print quality of the HR5 incidentally is as good as the reviews say.

P. Goff

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London SW3 5QQ



Eric Deeson - QL MANUAL INDEX

The QL Manual is a weighty loose leaf package with nine sections. And no index.

Here is an index of SuperBASIC keywords and key presses. If later versions of the Manual appear (mine is full of "typos"), page numbers may conceivably change. The numbers here refer to the version received in late June.

This index covers the following sections in order:

- Keywords
- Concepts (code C first appearance)
- Introduction (code I)
- Beginner's guide (code B)

Owners will, I hope, find the index useful; potential owners will have a bit more to think about; non-owners should be able to glean at least something from the list about the power and breadth of SuperBASIC. Be warned, though, that the Manual is not fully comprehensive, so therefore this index is not a complete list of recognised items. There's VER\$, for instance, which when PRINTed, tells you which QL you have (AH is the first dongle-less one).

That power is of course increased by the ability to define procedures and to call them by name (and perhaps parameters) at any time. Like this :

```
1000  DEFine PROCedure R
1010      RANDOMISE
1020  END DEFine R
. . . .
100    R
```

(Yes, despite some rumours, line numbers are needed in SuperBASIC though only RESTORE could, ever need them. The rumour probably arose from the fact that programs written within the QL Archive environment do not take line-numbers.)

ABS 1 B58
ACOT 3
ADATE 1 C9
AND C33 B63
ARC(R) 2 C23 B81
AT C52 B51, 73
ATAN 3
AUTO 3 B28

BAUD 4 C13
BEEP 4, 45
BEEPING 5
BLOCK 5 C36 B50, 77
BORDER 6 C52 B17, 29, 50, 72, 77
BREAK 3,16 B1

CALL 6
CAPSLOCK 15 B2
CHR\$ 7 C5 B69
CIRCLE(R) 7 C23 B72, 79
CLEAR 8
CLONE C30a
CLOSE 8 C4,13, 30 B76
CLS 9 B51, 75
CODE 9 C22
CON C16
CONTINUE 10 C19 B1
COPY(N) 10, 17 B30, 105
COS 11
COT 11
CSIZE 12 B51, 78
CTRL 15 B2
CURSOR 17 C52 B51, 73

DATA 13 C22
DATE(\$) 14 C9
DAY\$ C9
DEG 15
DEF FN 15 C21 B98
DEFPROC 16 C21 B40, 54, 96
DELETE 17 B30, 109
DIM 17 C1, 48 B34, 38
DIMN 18
DIR 19 C30 B29, 51, 76
DIV 18 C33 B60
DLINE 19

E B57
EDIT 20 B29
ELSE 26 B92
END DEF 15, 16 B40
END FOR 23 B89
ENDIF 26
ENDREP 49 B89
ENDSEL 53
ENTER 15 B3
EXEC(N) 20 C22, 30
EXIT 21 C40 B19, 52, 89
EXP 21

FILL 22 C23, 51 B81
FILL\$ 22 B69
FLASH 23 B51, 75
FOR 23 C40 B35, 52, 88
FORMAT 24 C30, 16

GOSUB 25 B54
GOTO 25

IF 26 C49 B19, 47, 54, 63, 70
INK 27 C52 B16, 50, 72
INKEY\$ 28
INPUT 28 B11, 52
INSTR 29 C33
INT 29 B58

KEYROW 30 C26

LBYTES 31 C30
LEN 31 B69
(LET) 32 C20, 43 B7, 12, 22, 47, 57,69
LINE (R) 32 C23 B16, 79
LIST 33 B4, 51
LLIST C2
LN 34
LOAD 33 C30 B30
LOCAL 34 C21 B102
LOG 34
LPRINT C2
LRUN 35 C30a B30

MDV C16 B75
MERGE 36 C30 B30
MOD 36 C33 B60
MODE 37 C42, 44 B16, 49, 73
MOVE 37 C51
MRUN 35

NET 38 C16, 32, 111
NEW 38 B4
NEXT 39 C40 B89
NOT C33 B49, 64

ON 39 B93
OPEN 40 C4, 13 B76
OPEN IN 40 C30 B105
OPEN NEW 40 C30 B76, 105
OR C33 B63
OVER 40 B51, 78

PAN 41 C52 B51, 82
PAPER 41 C52 B16, 50, 72
PAUSE 42
PEEK 42
PENUP/DOWN 43 C51
PI 43
POINT (R) 44 C23 B79
POKE 44
PRINT 45 B51, 72

RAD 45
RANDOMISE 46
READ 13 B35
RECOL 47 B51
REM 47
RENUM 48
REPEAT 49 C40 B18, 52, 88
RESET B1
RESTORE 13
RETRY 10 C19
RETURN 48
RND 46 B17, 58
RUN 49 B4

SAVE 50 C30 B29
SBYTES 50 C30
SCALE 53 C23 B16
SCR 16 B76
SCROLL 52 C37, 52 B51, 82
SDATE 51 C9
SELECT 53 C40 B92
SER C16
SEXEC 54 C30
SGN B58
SHIFT 15 B2
SIN 51
SQRT 54 B58
STEP 23
STOP 55
STRIP 55 C52 B51, 78

TAN 56
(THEN) 26 B92
TURN (TO) 56 C51

UNDER 57 B51, 78
XOR C33 B65

WINDOW 57 C36, 42, 52 B51, 72, 77

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ACKERMANN'S FUNCTION

Some years ago Doctor Dobb's Journal of Computer Callisthenics and Orthodontia (DDJ) had an article on a mathematical oddity called Ackermann's function. The article resulted in a considerable amount of interesting correspondence.

Ackermann's function may be defined as follows:

$$\begin{aligned}\text{Ack}(0,n) &= n+1 \\ \text{Ack}(m,0) &= \text{Ack}(m-1,1) \\ \text{Ack}(m,n) &= \text{Ack}(m-1,\text{Ack}(m,n-1))\end{aligned}$$

Ackermann's function is of interest to computer scientists because of its highly recursive nature. A simpler example of a recursive definition is that of a factorial:

$$\text{Fact}(n) = n * \text{Fact}(n-1)$$

The original DDJ article (Issue 31) gave an MC6800 assembly language program for calculating Ackermann's function. It makes an interesting exercise in recursive programming so I have translated the program into MC68000 assembly language, for my

MC68000 development system. Since I only have 8K of RAM, and the program requires vast amounts of stack space for quite moderate values of m and n, the highest value I can compute is Ack(3,4) which is 125.

	OPT	OBJ-H	
CHROUT	EQU	\$408	
CRLF	EQU	\$40C	
BLANK	EQU	\$410	
GXB	EQU	\$41C	
PRMESS	EQU	\$440	
WSTART	EQU	\$454	
	ORG	\$1000	
	MOVE.L	£\$3000,SP	
	JSR	CRLF	
	MOVE.L	£MESS1,A0	
	JSR	PRMESS	
	CLR.L	D0	
	JSR	GXB	GET m IN D0
	JSR	BLANK	
	MOVE.L	D0,-(SP)	SAVE m
	JSR	CRLF	
	MOVE.L	£MESS2,A0	
	JSR	PRMESS	
	CLR.L	D0	
	JSR	GXB	GET n IN D1
	JSR	CRLF	
	MOVE.L	D0,D1	
	MOVE.L	(SP)+,D0	m IN D0
	BSR	ACK	CALCULATE ACK(m,n)
	MOVE.L	D1,D0	PRINT VALUE
	BSR	BINDEC	
	JMP	WSTART	

*** ACK ***

*CALCULATE ACKERMANN'S FUNCTION Ack(m,n)

*ON ENTRY

*D0 = m, D1 = n

*ON EXIT

*Ack(m,n) RETURNED IN D1

ACK

TST.L	D0	m = 0?
BNE	RECALL	NO
ADD.L	£1,D1	YES, RETURN n + 1
RTS		

RECALL

TST.L	D1	m = 0, n = 0?
BNE	RERECALL	NO
SUB.L	£1,D0	YES, D0 = m-1
MOVE.L	£1,D1	D1:=1
BSR	ACK	(m - 1,1)
RTS		

RERECALL

MOVE.L	D0,-(SP)	
SUB.L	£1,D1	D1:=n-1
BSR	ACK	(m . n-1)
MOVE.L	(SP)+,D0	
SUB.L	£1,D0	D0:=m-1
BSR	ACK	
RTS		

*** BINDEC ***

*CONVERT BINARY NUMBER TO DECIMAL
*ON ENTRY, THE LOW WORD OF D0 HOLDS THE NUMBER TO BE CONVERTED
*ALL REGISTERS PRESERVED

```
BINDEC      MOVEM.L   D0-D1,-(SP)
            MOVE.W   £4,D1      COUNT FOR 5 DIGITS
BINDEC1     DIVU     £10,D0      REMAINDER IN UPPER WORD OF D0
            SWAP     D0          REMAINDER IN LOWER WORD
            ADD.B    £'0',D0     CONVERT TO ASCII
            MOVE.B   D0,-(SP)    SAVE CHARACTER ON STACK
            CLR.W    D0          CLEAR LOWER WORD
            SWAP     D0          QUOTIENT IN LOWER WORD
            DBRA     D1,BINDEC1  GO ROUND AGAIN UNTIL 5 DIGITS
            MOVE.W   £4,D1      5 DIGITS ON STACK
BINDEC2     MOVE.B   (SP)+,D0    POP CHARACTER OFF STACK
            JSR      CHROUT      PRINT IT
            DBRA     D1,BINDEC2
            MOVEM.L  (SP)+,D0-D1
            RTS

MESS1       DC.B    ' m? ',00
MESS2       DC.B    ' n? ',00

            END
```

Try writing a program in SuperBASIC to calculate Ackermann's function.

Leon Heller

EARLY QL MODIFICATIONS

by

FRANCIS CAMERON

My QL D05-001497 arrived on the 1st of June, which wasn't bad for an instrument promised for the end of May. I used it quite a lot, though not so much as a business house might, and it gave up the ghost after a couple of weeks. (It started by refusing to save 92 lines of program and eventually decided that *felo de se* was the only future worth facing.) So back it went. On the 19th. With £5.82 to the GPO for 1st class recorded delivery. Worth it, in the long run, because Sinclair's Received Parcel arrived on the doorstep on the 29th.

But, it's not the same!

My replacement machine is D06-003376 and it doesn't look nearly so bright and shining as you might expect. I can't help wondering if it's a part-used model though, so far as I can tell, it's fully-functioning and that completely satisfies the terms of the guarantee.

And there's no external ROM. Like the man said: as from now it's all inside.

Switch on in TV mode and the screen is different too. My first QL ran its programs on an attractive pale green background. There wasn't a true white among the colours. And listing was in red ink. Now that's all changed. If you want it, you can have backgrounds whiter-than-white and listings come up in white ink on a rich blue paper. Such luxury!

And that's not the end of it. The lines and columns have been put right. Page 2 of the QL. Keywords has the example: AT 10,20 : PRINT 'This is at line 10 column 20' which is fair enough and no doubt what was intended - except that on my first QL. it came out as column 10 and row 20! And I've got a program to prove it! Dear old D05 ponged a ball from side to side of the screen. D06 runs the same Microdrive recording from top to bottom. Must be some red faces somewhere ...

Which brings me to the Psion software (and, incidentally, mine didn't come back with the replacement QL) . I wonder if the internal changes have invalidated one or more of my earlier copies? I get a very clear message 'At line 200 bad or changed medium' and after that nothing useful happens. Ah well, back to the drawing board!

68K/OS *Product Summary*

The Product

68K/OS is a small, powerful and sophisticated operating system designed specifically for OEM terminals and personal computers employing the Motorola MC68000 series processors. The system provides full functionality including multi-tasking, device independent input/output and multiple screen windows, without the need for a complex and expensive hardware configuration.

There is no other operating system on the market for the MC68000 series processors that succeeds in bridging the large functionality gap between CP/M and Unix at such low hardware and licensing costs.

Key Features

The major features of 68K/OS are:

- * Single-user, multitasked operating system
- * Multiple screen windows using a bitmapped colour screen
- * Highly optimised disk filing system
- * Device independent input/output subsystem
- * Unix-like pipes for inter-program communication
- * Menu and form handling package
- * Choice of command or menu driven shell program
- * Integral graphics routines for line, rectangle, circle, ellipse, etc.
- * System can be ROM resident, requiring only 32Kb ROM and 8Kb RAM
- * Full set of utility software available

GST are currently negotiating with a number of software suppliers to provide the following applications software for use with 68K/OS:

- * Languages: Basic, C, Pascal, Fortran 77, Assembler
- * Applications: Word Processor, Spreadsheet, Database, Business Graphics

The development of new applications software for 68K/OS will be aided by the comprehensive applications software interface, whose facilities rival those found on many minicomputer operating systems.